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## (54) Prosthetic implant with fins

Prothetisches Implantat mit Rippen

Implant prothétique à ailettes

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## Description

### FIELD OF THE INVENTION

[0001] The present invention relates to a prosthetic implant, and more particularly to a stemmed implant having fins extending therefrom.

### BACKGROUND OF THE INVENTION

[0002] It is known in the field of orthopaedics to utilize fins which extend from a stem portion of a prosthetic implant. The following patents disclose fins along the anterior and posterior sides of femoral implants in which the fins are inset from the lateral side of the stem: US Patent 4,944,761 to Stuhmer et al; US Patent 4,795,471 to Oh; US Patent 4,728,334 to Spotorno; US Patent 4,704,128 to Frey; US Patent 4,698,063 to Link et al and French Patent 2,639,821 to Istria. US Patents 4,944,761 and 4,698,063 also include fins projecting from the lateral side. Also, US Patent 5,201,767 to Caldarise et al discloses a plurality of fins extending about the proximal lateral side of the femoral stem, and US Patent 4,549,319 to Meyer discloses a plurality of fins extending circumferentially about the femoral stem.

[0003] DE-OS-26,27,569 discloses a femoral element of a hip joint endoprosthesis to be cemented into the marrow channel of the bone, with a slender neck supporting the joint ball, a wider middle portion and a shaft tapering towards the free end, which in its upper, tilted section extending over about one-third of its length is provided on the convex outside surface with at least one projecting contact edge, characterised in that on the outside the contact edge has a ridge whose cross-section is approximately triangular and whose height is such that the ridge line penetrates into the trochanter bone, the lower section of the shaft has a longitudinal groove on its inside surface and a centreline, which is the same distance away from the outside surface of the shaft as from the inside surface, extends in a straight line in the section beyond the tilted section.

[0004] GB-A-2,286,146 discloses an artefact, such as a hip implant, with controlled mechanical properties is manufactured by filament winding a matrix precursor impregnated fibre material onto a mandrel. At least part of the periphery in cross-section of the mandrel corresponds with a boundary in longitudinal section of a product, preferably more than one product positioned end to end. The shape of the wound product is modified if necessary by applying thereto a preformed shaped piece of compatible matrix precursor impregnated fibre material. At least one and preferably a multiplicity of product artefacts are generated by cutting from the wound product after curing.

### SUMMARY OF THE INVENTION

[0005] According to the present invention, there is provided a prosthetic implant including a stem having a proximal portion and a distal portion, and a medial side and a lateral side separated by a pair of sidewalls, and wherein the stem includes two lateral fins extending outwardly from the lateral side characterised in that the lateral fins each include a lateral face which is flush with the lateral side of the stem.

[0006] The present invention provides a prosthetic implant which includes a stem having two lateral fins. The lateral fins extend outwardly from the lateral side of the stem, such that the lateral face of each fin is flush with the lateral side of the stem. The lateral face of each of the lateral fins forms a substantially planar, triangular surface with the lateral side of the stem. The triangular surface is formed by the outer edges of the two lateral fins and the lateral edge of the shoulder of the implant. The lateral fins extend from the proximal portion of the stem.

[0007] The stem further includes a secondary fin extending from each sidewall. Each secondary fin is inset from the lateral side of the stem toward the medial side. The secondary fins are substantially triangular in cross-section, and extend from the proximal portion of the stem. The secondary fins include a top surface spaced below the shoulder of the stem.

[0008] Accordingly, it is an advantage of the invention to provide a finned implant which will lateralize the prosthesis to achieve a valgus position in the bone.

[0009] Another advantage of the invention is to provide secondary stability to the shaped stem of the implant.

[0010] A further object of the invention is to provide rotational stability of the stem in the bone.

[0011] Still other advantages of the invention will become apparent upon reference to the accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Fig. 1 is a perspective view of a hip prosthesis according to the present invention.

[0013] Fig. 2 is a side view of the hip prosthesis of Fig. 1.

[0014] Fig. 3 is a front view thereof.

[0015] Fig. 4 is a rear view thereof.

[0016] Fig. 5 is a top plan view thereof.

[0017] Fig. 6 is a cross-sectional view of the prosthesis taken along lines 6-6 of Fig. 2.

[0018] Fig. 7 is a cross-sectional view of the prosthesis taken along lines 7-7 of Fig. 2.

[0019] Fig. 8 is a cross-sectional view of the prosthesis taken along lines 8-8 of Fig. 2.

[0020] Fig. 9 is a cross-sectional view of the prosthesis taken along lines 9-9 of Fig. 2.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] Figs. 1-9 illustrate a particularly advantageous

embodiment of a prosthetic implant 1 according to the present invention. The invention will be described with reference to a femoral component of a hip prosthesis, and is particularly suitable as such. However, it is understood that the principles of the invention may be suitable for other implants having elongated fixation stems, such as a humeral component for a shoulder prosthesis.

**[0022]** The femoral component or prosthetic implant 1 includes a stem 2 having a proximal portion 3 and a distal portion 4. The stem also includes a medial side 5 and a lateral side 6 separated by a pair of sidewalls 7. Sidewalls 7 correspond to the anterior and posterior sides of the femoral component 1. The proximal portion 3 of the stem 2 terminates proximally in a superior shoulder 8 with a neck 10 extending therefrom. The stem 2 includes two lateral fins 20 extending outwardly from the lateral side 6. The lateral fins 20 each include a lateral face 21 which is flush with the lateral side 6 of the stem 2.

**[0023]** The lateral fins 20 each have an outer edge 22 such that a width is defined between the two outer edges 22 of fins 20. This width increases as the fins 20 extend toward shoulder 8. The lateral face 21 of each of the lateral fins forms a substantially planar, triangular surface 25 which blends into the lateral side 6 of stem 2.

**[0024]** The lateral side 6 is a substantially flat, planar surface which extends from the shoulder 8 to distal tip 15 of stem 2. This planar surface is substantially parallel to the longitudinal axis A of stem 2. Thus, the lateral side 6 is essentially a flat planar surface with a 0°.angle relative to axis A of stem 2.

**[0025]** The lateral fins 20 extend from the proximal portion 3 of stem 2. When the femoral component is positioned in a femur (not shown), the position of the distal end 28 of fins 20 corresponds approximately to the junction between the metaphysis and diaphysis or the isthmus junction of the femur. The fins 20 extend proximally from distal end 28 to the superior shoulder 8. The triangular surface is formed by the outer edges 22 of the two lateral fins and by a lateral edge 26 of shoulder 8. A chamfer 27 may be provided between outer edges 22 and the lateral edge 26 of shoulder 8 to prevent a sharp corner on fins 20. The lateral fins are positive cutting or self cutting fins, such that upon insertion of the femoral component 1 into the femur, the fins 20 will cut into and become embedded in the cancellous bone of the femur. The outer edge 22 of fins 20 form a concave curve for better fitting of the fin in the femoral canal. The planar triangular surface 25 is a continuation of the straight planar lateral side 6. The curved outer edges 22 of fins 20 blend into the lateral side of stem 2.

**[0026]** The lateral fins 20 include an inner face 23 which is comprised of a concave groove 24 which extends from the outer edge 22 of each fin 20 toward a respective one of the sidewalls 7 to blend the lateral fins 20 into the respective sidewall 7. The groove 24 provides a means of releasing stress while compressing the bone when the component 1 is implanted in a femur.

**[0027]** With the guidance of the straight lateral side 6, the lateral fins 20 on the proximal portion 3 of stem 2 will lateralize the femoral component 1 to achieve a valgus position in the femur. The straight lateral side 6 along with the lateral fins 20 which expand or widen as the fins 20 approach shoulder 8 help to provide rotational stability for the stem 2 in the femur to supplement the fixation of the stem in the femur. The fins 20 also provide a secondary stability to the wedge shaped body of stem 2. The wedge shape of the stem 2 provides the primary mode of fixation, while the fins 20 provide secondary fixation by providing rotational stability.

**[0028]** The stem 2 has a cross-section which is substantially wedge-shaped such that the sidewalls 7 angle toward each other as the sidewalls approach medial side 5. The medial side 5 of the cross-section comprises a convex curve. In addition, the sidewalls 7 are substantially planar and taper toward the longitudinal axis A of stem 2 as the sidewalls progress from the shoulder 8 toward the distal tip 15 of stem 2. The proximal portion 3 of the medial side 5 of stem 2 is comprised of a concave curve which blends into the distal portion 4 of the medial side 5 which tapers toward the longitudinal axis A as the medial side 5 extends toward the distal tip 15 of stem 2. The taper of the medial side of the distal portion 4 enhances proximal fixation in the femur.

**[0029]** The femoral component 1 further includes a secondary fin 30 extending from each sidewall 7. Each secondary fin 30 is inset about 7 to 14mm from the lateral side 6 toward the medial side 5. Fins 30 extend from the proximal portion 3 of stem 2. When the femoral component 1 is positioned in a femur, the position of the distal end 38 of fins 30 also corresponds approximately to the isthmus junction of the femur. The fins 30 stop at a proximal end 39 at about the level of the lesser trochanter of the femur in order to help prevent the femur from splitting upon insertion of the femoral component 1 into the femur. Fins 30 provide additional rotational stability. The fins 30 include a top surface 31 which is spaced about 14 to 19mm below the shoulder 8 of stem 2. The length of the fins 30 is about 27-39mm. The top surface 31 is chamfered downwardly toward distal tip 15 of stem 2. The chamfer of top surface 31 is preferably formed by a concave radius and is incorporated onto fins 30 for ease of removal in case the femoral component 1 must be removed, such as for revision surgery.

**[0030]** The fins 30 are substantially triangular in cross-section. The secondary fins 30 each have a lateral facing surface 33 which extends substantially perpendicular to the corresponding sidewall 7 of stem 2. A radius 34 helps to blend the lateral facing surface 33 to sidewall 7 while providing a compression surface for the bone when component 1 is implanted in a femur. The medial facing surface 32 forms an acute angle, such as about 35°, with lateral facing surface 33. The secondary fins 30 extend further away from stem 2 as fins 30 progress toward shoulder 8.

**[0031]** Both the lateral fins 20 and the secondary fins 30 extend in a longitudinal direction relative to stem 2.

Fins 20 and fins 30 all extend proud from the stem 2. Fins 20 and 30 may extend up to about 2.5mm proud of the stem 2, and may be up to about 2 to 3mm wide. This femoral component 1 of the present invention is generally intended for use in a press-fit noncemented application. Thus, the shape of the corresponding rasp (not shown) which prepares the bone opening to receive the femoral component 1, corresponds to the shape of the stem 2. However, the corresponding rasp preferably does not include fins, so that when the actual femoral component 1 is implanted into the bone, the stem 2 will form a press-fit with the opening prepared by the rasp, while the fins 20 and 30 cut into the bone and become embedded into the cancellous bone of the femur.

**[0032]** It is noted that the femoral component 1 may be made with a separate modular head (not shown) which is fitted to tapered neck 10, or the head may be integrally formed on the prosthetic implant 1, as desired. The neck 10, as shown, for fitting with various styles and sizes of modular heads includes a first taper 11 which is sized to frictionally fit with a corresponding recess (not shown) in a modular head. The taper 11 thus mates with this recess. The neck 10 includes a reduced neck portion 12 which extends outwardly of the modular head in order to provide for a better range of motion of the femoral component 1 with a corresponding acetabular component (not shown). Such a reduced neck is well known in the art of orthopaedics. The present invention preferably utilizes a 12/14 taper on taper 11 to mate with a corresponding 12/14 tapered recess of a corresponding femoral head. The reduced neck portion 12 is then a 10/12 taper to provide for the better range of motion. The femoral component 1 also preferably comes in a range of sizes, such as 9,10,11,12,13,14,15,16,17,18, and 19mm length stems. However, it is noted that the present invention is not limited to the particular sizes noted herein.

**[0033]** The femoral component I may also include a recess 9, as is known in the art, for use with a stem inserter for assisting in positioning the component 1 in the femur. A proximal through hole may also be provided, as is known in the art, for use with an extraction rod in case the component 1 needs to be removed from the bone. A groove 14 is provided which corresponds to the osteotomy level on the femur. The groove 14 helps to properly position the component 1 in the bone.

**[0034]** The femoral component 1 also may include a roughened surface finish, such as a blast finish to enhance the fixation of component 1 to the bone. A roughened surface, such as a corundum blast surface, or any other suitable roughened surface may be utilized. This blast surface provides an ongrowth surface which may enable bone to grow onto the surface of the stem 2 to enhance long term fixation. The blast surface B, as shown in Fig. 1, may be provided from approximately the junction J of the stem 2 with the neck 10 to the distal tip 15. The component 1 is preferably made of a titanium alloy; however, any suitable material may be utilized. The component may be manufactured by any suitable manufacturing methods.

**[0035]** While this invention has been described in terms of a particularly advantageous embodiment, those skilled in the art can appreciate that modifications can be made without departing from the scope of this invention.

## Claims

1. A prosthetic implant (1) including a stem (2) having a proximal portion (3) and a distal portion (4), and a medial side (5) and a lateral side (6) separated by a pair of sidewalls (7), and wherein the stem (2) includes two lateral fins (20) extending outwardly from the lateral side (6) **characterised in that** the lateral fins (20) each include a lateral face (21) which is flush with the lateral side (6) of the stem (2).

2. An implant according to Claim I wherein the proximal portion (3) of the stem (2) terminates proximally in a superior shoulder (8) with a neck (10) extending therefrom.

3. An implant according to Claim 1 or 2, wherein the two lateral fins (20) each having an outer edge (22), and wherein a width is defined between the two outer edges of the fins (22), said width increasing as the fins (20) extend toward the shoulder (8).

4. An implant according to any preceding claim wherein the lateral face (21) of each of the lateral fins (20) forms a substantially planar surface (25) with the lateral side (6) of the stem (2).

5. An implant according to any preceding claim wherein the lateral face (6) of each of the lateral fins (20) forms a substantially planar, triangular surface (25) with the lateral side (6) of the stem (2).

6. An implant according to any preceding claim wherein the lateral fins (20) extend from the proximal portion (3) of the stem (2).

7. An implant according to any preceding claim wherein the lateral fins (20) are self cutting fins.

8. An implant according to any preceding claim wherein the two lateral fins (20) each have an outer edge (22) and wherein each outer edge forms a concave curve.

9. An implant according to any preceding claim wherein the two lateral fins (20) each have an outer edge (22) and wherein the triangular surface (25) is formed by the outer edges (22) of the two lateral fins (20) and a lateral edge (26) of the shoulder (8).

10. An implant according to any preceding claim wherein the stem (2) has a cross-section which is substantially wedge-shaped such that the sidewalls (7) angle toward each other as the sidewalls approach the medial side (5).

11. An implant according to any preceding claim wherein the medial side (5) of the cross-section comprises a convex curve.

12. An implant according to any preceding claim wherein the stem (2) has a longitudinal axis (A) and wherein the sidewalls (7) are substantially planar and taper toward the axis (A) as the sidewalls progress from the shoulder (8) toward a distal tip (15) of the stem (2).

13. An implant according to any preceding claim wherein the stem (2) has a longitudinal axis (A) and wherein the lateral side (6) is a substantially flat, planar surface which extends from the shoulder (8) to a distal tip (15) of the stem (2) and which planar surface is substantially parallel to the axis (A) of the stem (2).

14. An implant according to any preceding claim wherein the stem (2) has a longitudinal axis (A) and wherein the proximal portion (3) of the medial side (5) of the stem (2) is comprised of a concave curve which blends into the distal portion (4) of the medial side (5) which distal portion tapers toward the axis (A) as the medial side (5) extends toward a distal tip (15) of the stem (2).

15. An implant according to any preceding claim wherein the lateral fins (20) include an inner face (23) which is comprised of a concave groove (24) which extends from an outer edge (22) of each fin (20) toward a respective one of the sidewalls (7) to blend the lateral fins (20) into the respective sidewall (7).

16. An implant according to any preceding claim wherein the stem (2) further includes a secondary fin (30) extending from each sidewall (7), each said secondary fin (30) being inset from the lateral side (6) toward the medial side (5).

17. An implant according to any preceding claim, wherein the secondary fins (30) are substantially triangular in cross-section and extend from the proximal portion (3) of the stem (2), and wherein the secondary fins (30) include atop surface (31) spaced below the shoulder (8) of the stem (2).

18. An implant according to any preceding claim wherein the top surface (31) of the secondary fin (30) is chamfered downwardly toward a distal tip (15) of the stem (2).

19. An implant according to any preceding claim wherein the lateral fins (20) and the secondary fins (30) extend in a longitudinal direction relative to the stem (2).

20. An implant according to any preceding claim, wherein the secondary fins (30) extend a further distance away from the stem (2) as the secondary fins (30) progress toward the shoulder (8).

21. An implant according to any preceding claim wherein the secondary fins (30) each have a lateral facing surface (33) which extends substantially perpendicular to the corresponding sidewall (7) of the stem (2) and is blended to the stem (2) by a radius (34), and a medial facing surface (37) which forms an acute angle with the lateral facing surface (33).

22. An implant according to any preceding claim wherein the implant (1) is a femoral component of a prosthetic hip joint.

**Patentansprüche**

1. Prothetisches Implantat (1) mit einem Stiel (2), der einen proximalen Abschnitt (3) und einen distalen Abschnitt (4) besitzt, und einer nach der Mitte gelegenen Seite (5) und einer seitlichen Seite (6), die durch ein Paar Seitenwände (7) voneinander getrennt sind, und wobei der Stiel (2) zwei seitliche Rippen (20) enthält, die sich von der seitlichen Seite (6) nach außen weg erstrecken, **dadurch gekennzeichnet, dass** die seitlichen Rippen (20) jeweils eine Seitenfläche (21) aufweisen, welche bündig mit der seitlichen Seite (6) des Stiels (2) ist.

2. Implantat gemäß Anspruch 1, wobei der proximale Abschnitt (3) des Stiels (2) in der Nähe einer hochstehenden Schulter (8) mit einem sich von dieser erstreckenden Hals (10) abschließt.

3. Implantat gemäß Anspruch 1 oder 2, wobei die zwei seitlichen Rippen (20) jeweils eine Außenkante (22) besitzen und wobei die Breite durch die zwei Außenkanten der Rippen (20) definiert ist, wobei sich die Breite in Richtung der Rippen (20) zur Schulter (8) hin vergrößert.

4. Implantat gemäß einem der vorstehenden Ansprüche, wobei die Seitenfläche (21) jeder der seitlichen Rippen (20) eine mit der seitlichen Seite (6) des Stiels (2) im wesentlichen ebene Oberfläche (25) bildet.

5. Implantat gemäß einem der vorstehenden Ansprüche, wobei die Seitenfläche (21) jeder der seitlichen Rippen (20) eine mit der seitlichen Seite (6) des

Stiels (2) im wesentlichen ebene, dreieckige Oberfläche (25) bildet.

6. Implantat gemäß einem der vorstehenden Ansprüche, wobei die seitlichen Rippen (20) sich bei dem proximalen Abschnitt (3) des Stiels (2) erstrecken.

7. Implantat gemäß einem der vorstehenden Ansprüche, wobei die seitlichen Rippen (20) selbstschneidende Rippen sind.

8. Implantat gemäß einem der vorstehenden Ansprüche, wobei die zwei seitlichen Rippen (20) jeweils eine Außenkante (22) besitzen und wobei jede Außenkante eine konkave Krümmung bildet.

9. Implantat gemäß einem der vorstehenden Ansprüche, wobei die zwei seitlichen Rippen (20) jeweils eine Außenkante (22) besitzen und wobei die dreieckige Oberfläche (25) von den Außenkanten (22) der zwei seitlichen Rippen (20) und einer Seitenkante (26) der Schulter (8) gebildet ist.

10. Implantat gemäß einem der vorstehenden Ansprüche, wobei der Stiel (2) einen im wesentlichen keilförmigen Querschnitt besitzt, so dass die Seitenwände (7) in einer Richtung aufeinander zu verlaufen, in der die Seitenwände sich der nach der Mitte gelegenen Seite (5) nähern.

11. Implantat gemäß einem der vorstehenden Ansprüche, wobei die nach der Mitte gelegene Seite (5) des Querschnitts eine konvexe Krümmung aufweist.

12. Implantat gemäß einem der vorstehenden Ansprüche, wobei der Stiel (2) eine Längsachse (A) besitzt und wobei die Seitenwände (7) im wesentlichen eben sind und sich zur Achse (A) in einer Richtung hin verjüngen, in der sich die Seitenwände von der Schulter (8) zu einer distalen Spitze (15) des Stiels (2) hin erstrecken.

13. Implantat gemäß einem der vorstehenden Ansprüche, wobei der Stiel (2) eine Längsachse (A) besitzt und wobei die seitliche Seite (6) eine im wesentlichen flache, ebene Oberfläche ist, die sich von der Schulter (8) zu einer distalen Spitze (15) des Stiels (2) hin erstreckt und wobei die ebene Oberfläche im wesentlichen parallel zu der Achse (A) des Stiels (2) verläuft.

14. Implantat gemäß einem der vorstehenden Ansprüche, wobei der Stiel (2) eine Längsachse (A) besitzt und wobei der proximale Abschnitt (3) der nach der Mitte gelegenen Seite (5) des Stiels (2) eine konkave Krümmung aufweist, die in den distalen Abschnitt (4) der nach der Mitte gelegenen Seite (5) übergeht, wobei der distale Abschnitt sich in einer Richtung zu Achse (A) hin verjüngt, in der die nach der Mitte gelegene Seite (5) sich zu der distalen Spitze (15) des Stiels (2) hin erstreckt.

15. Implantat gemäß einem der vorstehenden Ansprüche, wobei die seitlichen Rippen (20) eine innere Fläche (23) aufweisen, welche eine konkave Rille (24) umfasst, die sich von einer Außenkante (22) jeder Rippe (20) zu der jeweiligen Seitenwand (7) hin erstreckt, so dass die seitlichen Rippen (20) in die entsprechende Seitenwand (7) übergehen.

16. Implantat gemäß einem der vorstehenden Ansprüche, wobei der Stiel (2) ferner eine Sekundärrippe (30) aufweist, die sich von jeder Seitenwand (7) erstreckt, wobei jede Sekundärrippe (30) zwischen der seitlichen Seite (6) und der nach der Mitte gerichteten Seite eingesetzt ist.

17. Implantat gemäß einem der vorstehenden Ansprüche, wobei die Sekundärrippen (30) einen im wesentlichen dreieckigen Querschnitt besitzen und sich von dem proximalen Abschnitt (3) des Stiels (2) erstrecken und wobei die Sekundärrippen eine obere Oberfläche (31) besitzen, die beabstandet unterhalb der Schulter (8) des Stiels (2) liegt.

18. Implantat gemäß einem der vorstehenden Ansprüche, wobei die obere Oberfläche (31) der Sekundärrippe (30) nach unten entgegen einer distalen Spitze (15) des Stiels (2) abgeschrägt ist.

19. Implantat gemäß einem der vorstehenden Ansprüche, wobei die seitlichen Rippen (20) und die Sekundärrippen (30) sich bezüglich des Stiels (2) in Längsrichtung erstrecken.

20. Implantat gemäß einem der vorstehenden Ansprüche, wobei die Sekundärrippen (30) in Richtung der Schulter (8) weiter von dem Stiel (2) abstehen.

21. Implantat gemäß einem der vorstehenden Ansprüche, wobei die Sekundärrippen (30) je eine in seitlicher Richtung gewandte Oberfläche (33), die sich im wesentlichen senkrecht zu der entsprechenden Seitenwand (7) des Stiels (2) erstreckt und die in den Stiel mit einem Radius (34) übergeht, und eine nach der Mitte gewandte Oberfläche (37) besitzt, welche einen spitzen Winkel mit der in seitlicher Richtung gewandten Oberfläche (33) bildet.

22. Implantat gemäß einem der vorstehenden Ansprüche, wobei das Implantat (1) eine Oberschenkelkomponente einer prothetischen Hüftverbindung ist.

**Revendications**

1. Implant prothétique (1) comportant une tige (2) possédant une portion proximale (3) et une portion distale (4), et un côté médial (5) et un côté latéral (6) séparés par une paire de parois latérales (7), et où la tige (2) comporte deux ailettes latérales (20) s'étendant vers l'extérieur depuis le côté latéral (6), **caractérisé en ce que** les ailettes latérales (20) comprennent chacune une face latérale (21) qui est en affleurement avec le côté latéral (6) de la tige (2).

2. Implant selon la revendication 1, où la portion proximale (3) de la tige (2) se termine proximalement dans un épaulement supérieur (8) avec un col (10) s'étendant de celui-ci.

3. Implant selon la revendication 1 ou 2, où les deux ailettes latérales (20) ont chacune un bord extérieur (22), et où une largeur est définie entre les deux bords extérieurs des ailettes (22), ladite largeur augmentant au fur et à mesure que les ailettes (20) s'étendent vers l'épaulement (8).

4. Implant selon l'une des revendications précédentes, où la face latérale (21) de chacune des ailettes latérales (20) forme une surface sensiblement plane (25) avec le côté latéral (6) de la tige (2).

5. Implant selon l'une des revendications précédentes, où la face latérale (6) de chacune des ailettes latérales (20) forme une surface triangulaire (25) sensiblement plane avec le côté latéral (6) de la tige (2).

6. Implant selon l'une des revendications précédentes, où les ailettes latérales (20) s'étendent à partir de la portion proximale (3) de la tige (2).

7. Implant selon l'une des revendications précédentes, où les ailettes latérales (20) sont des ailettes auto-coupantes.

8. Implant selon l'une des revendications précédentes, où les deux ailettes latérales (20) ont chacune un bord extérieur (22) et où chaque bord extérieur forme une courbe concave.

9. Implant selon l'une des revendications précédentes, où les deux ailettes latérales (20) ont chacune un bord extérieur (22) et où la surface triangulaire (25) est formée par les bords externes (22) des deux ailettes latérales (20) et un bord latéral (26) de l'épaulement (8).

10. Implant selon l'une des revendications précédentes, où la tige (2) présente une section transversale qui est sensiblement en forme de coin de telle sorte que les parois latérales (7) s'étendent selon un angle l'une vers l'autre lorsque les parois latérales approchent le côté médial (5).

11. Implant selon l'une des revendications précédentes, où le côté médial (5) de la section transversale comprend une courbe convexe.

12. Implant selon l'une des revendications précédentes, où la tige (2) présente un axe longitudinal (A) et où les parois latérales (7) sont sensiblement planes et diminuent vers l'axe (A) au fur et à mesure que les parois latérales avancent de l'épaulement (8) vers une pointe distale (15) de la tige (2).

13. Implant selon l'une des revendications précédentes, où la tige (2) présente un axe longitudinal (A) et où le côté latéral (6) est une surface plane, sensiblement plate, qui s'étend de l'épaulement (8) à une pointe distale (15) de la tige (2), la surface plane étant sensiblement parallèle à l'axe (A) de la tige (2).

14. Implant selon l'une des revendications précédentes, où la tige (2) possède un axe longitudinal (A) et où la portion proximale (3) du côté médial (5) de la tige (2) est constituée d'une courbe concave qui rejoint la portion distale (4) du côté médial (5), la portion distale diminuant vers l'axe (A) lorsque le côté médial (5) s'étend vers une pointe distale (15) de la tige (2).

15. Implant selon l'une des revendications précédentes, où les ailettes latérales (20) présentent une face interne (23) qui est constituée d'une rainure concave (24) qui s'étend depuis un bord externe (22) de chaque ailettes (20) vers respectivement l'une des parois latérales (7) pour amener les ailettes radiales (20) à se confondre dans la paroi latérale respective (7).

16. Implant selon l'une des revendications précédentes, où la tige (2) comprend en outre une ailettes secondaire (30) s'étendant à partir de chaque paroi latérale (7), chaque ailette secondaire (30) étant rentrée depuis le côté latéral (6) vers le côté médial (5).

17. Implant selon l'une des revendications précédentes, où les ailettes secondaires (30) sont sensiblement triangulaires en section transversale et s'étendent de la portion proximale (3) de la tige (2), et où les ailettes secondaires (30) comportent une surface supérieure (31) espacée en dessous de l'épaulement (8) de la tige (2).

18. Implant selon l'une des revendications précédentes, où la surface supérieure (31) de l'ailette secon-

daire (30) est chanfreinée vers le bas, vers une pointe distale (15) de la tige (2).

**19.** Implant selon l'une des revendications précédentes, où les ailettes latérales (20) et les ailettes secondaires (30) s'étendent dans une direction longitudinale relativement à la tige (2).

**20.** Implant selon l'une des revendications précédentes, où les ailettes secondaires (30) s'étendent à partir de la tige (2) sur une plus grande distance que les ailettes secondaires (30) avancent vers l'épaulement (8).

**21.** Implant selon l'une des revendications précédentes, où les ailettes secondaires (30) ont chacune une surface (33) orientée latéralement qui s'étend sensiblement perpendiculairement à la paroi latérale correspondante (7) de la tige (2) et qui rejoint la tige (2) suivant un rayon (34), et une surface (37) orientée médialement (37) qui forme un angle aigu avec la surface (33) orientée latéralement.

**22.** Implant selon l'une des revendications précédentes, où l'implant (1) est un composant fémoral d'une articulation prothétique de la hanche.

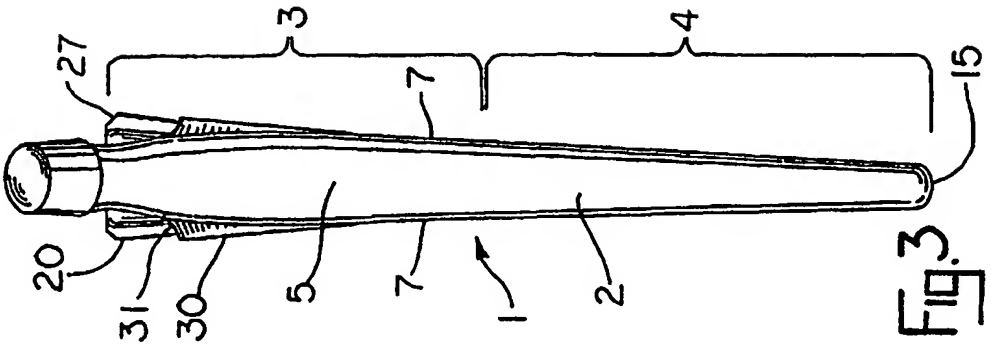


Fig.3

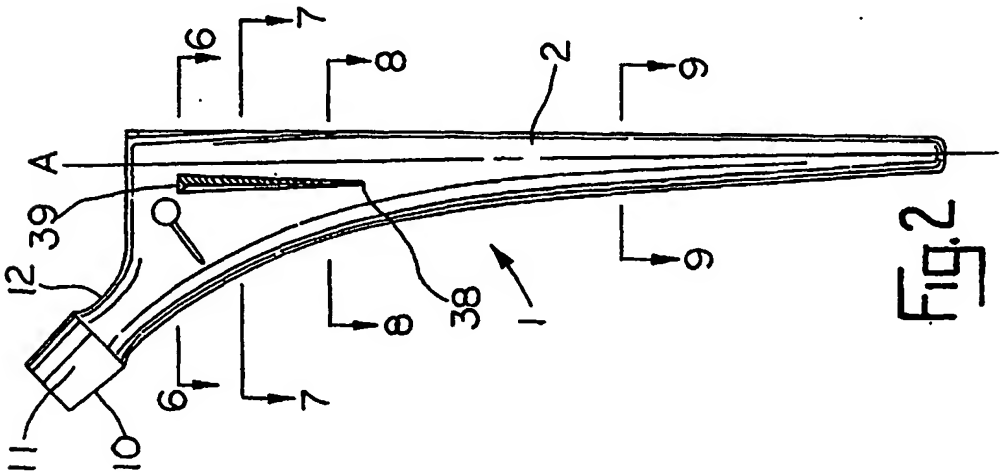


Fig.2

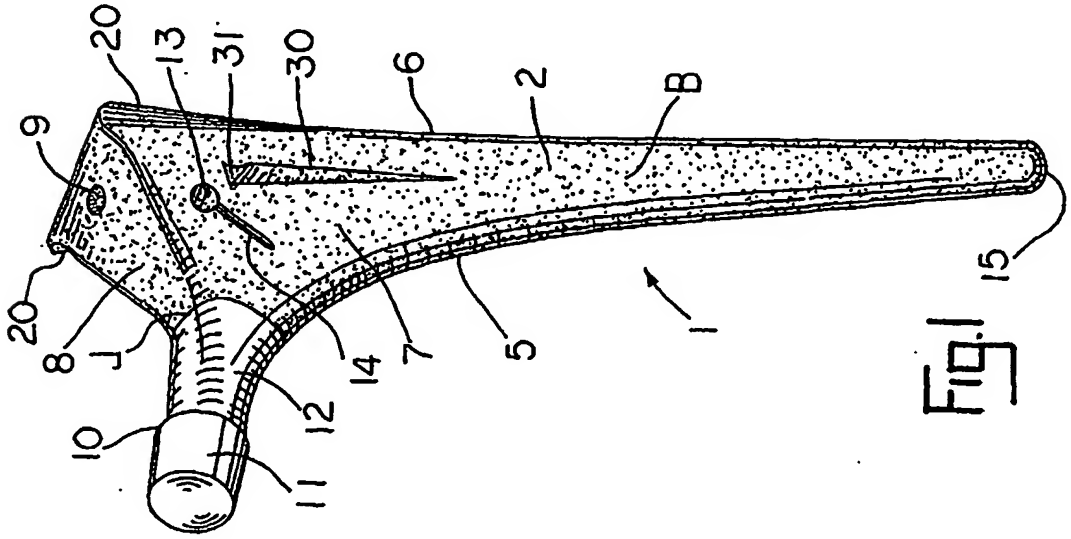


Fig.1

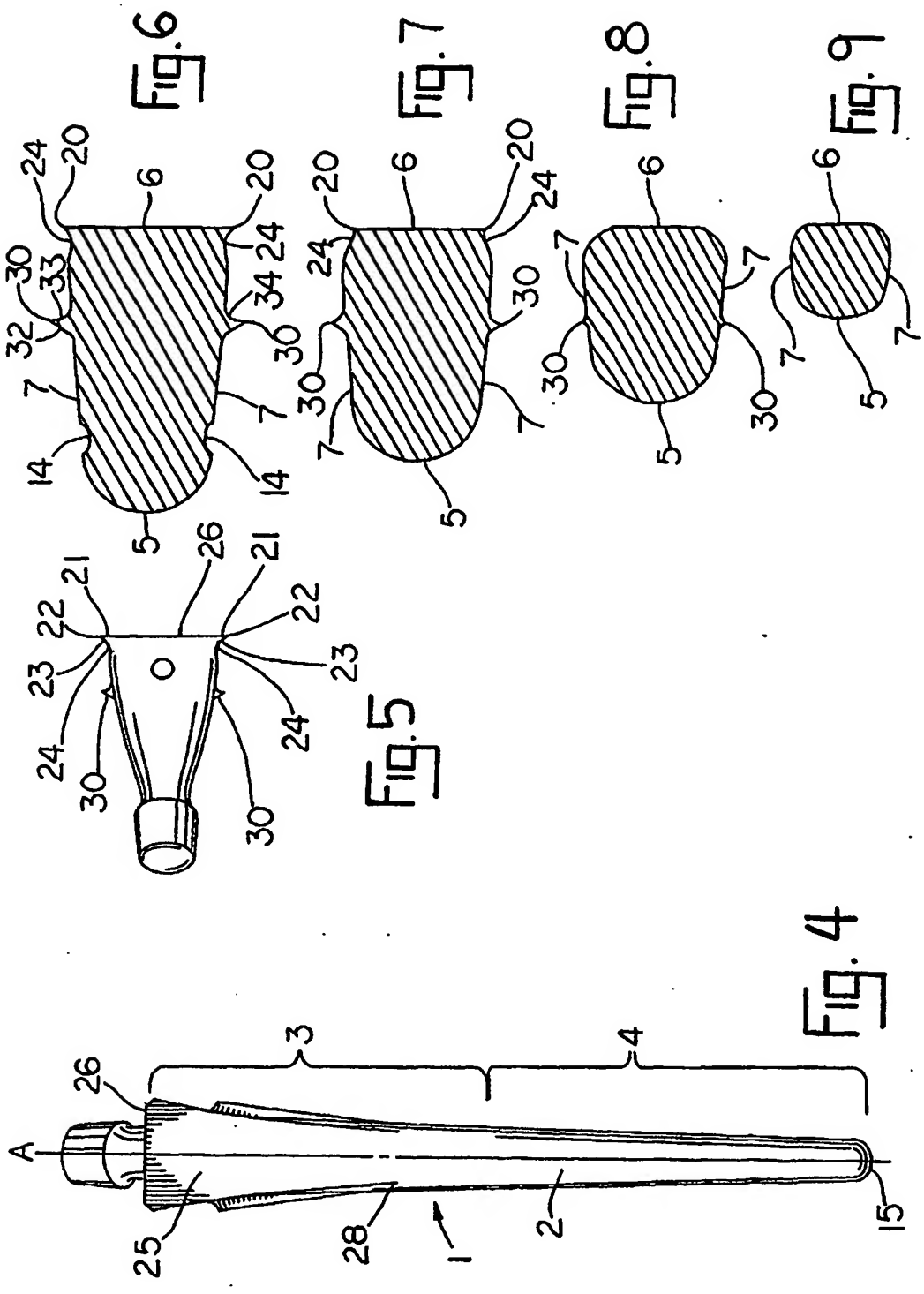


Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9